Composting Source Separated Human Faeces For Treatment and Sanitation


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Abstract

In urine diverting toilets, urine and faeces are collected separately. The purpose is to collect the
fractions in their undiluted and small volume concentrations and to recycle their nutrient content.
Faeces should be treated before they are used in agriculture since they may contain enteric
microorganisms, some of which may be pathogenic. In this paper, composting of human faeces with
food waste was investigated as a method for treatment and sanitation in three successive experiments.
The temperature development in three 405x405x475 mm compost boxes fed with faeces-to-food
waste (F:FW) in wet weight ratios of 1:0, 3:1 and 1:1 was studied. The moisture levels were
controlled to between 40-60% and the pH range was 6.9-9.4. Use of 25 mm thick styrofoam insulation
all around the outside of the compost boxes and turning of the compost once in three days enabled
sanitising temperatures (≥50°C) to be reached and sustained for over a week in the F:FW = 1:1
compost. The reduction of >3 log_{10} for E. coli and >4 log_{10} for Enterococcus spp. was achieved when
co-composting faeces and food waste in a wet weight mix ratio of about 1:1. This, in combination
with the long period of temperatures >50°C indicated that the compost was sanitised.

Key words: Composting, faeces, pathogens, sanitation, temperature

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